

STATISTICS THROUGH APPLICATIONS SECOND EDITION

STARNES • YATES • MOORE



Chapter 5

Sampling and Surveys

Section 5.1

Samples, Good and Bad

How many fish are in a lake?

Use a sampling process called capture/recapture by "tagging" a sample of fish

The proportion of tagged/untagged should be similar to sample size/population

Does it work?

How many fish in the sea outline.xlsx

How to sample badly

Town Talk survey, call in to vote "yes" or "no"
Responders have strong enough opinion to call in
"Vote early and vote often" techniques can skew results

Biased sampling methods

A study is biased if it systematically favors certain outcomes

Voluntary response sample chooses itself by responding (i.e. call in votes)

Convenience sampling chooses the individuals who are easiest to reach (i.e. mall shoppers)

Opinion polls

You can participate just by visiting www.misterpoll.com!

"None of these polls are scientific, but do represent the collective opinion of everyone who participates"

<http://www.misterpoll.com/>

Simple Random Sample (SRS)

A SRS of size n consists of n individuals from the population chosen in such a way that every set of n individuals has an equal chance to be the sample actually selected.

Random digits

A table of random digits is a long string of the digits 0,1,2,3,4,5,6,7,8,9 with these two properties:

Each entry in the table is equally likely to be any of the 10 digits 0 through 9

The entries are independent of each other. That is, knowledge of one part of the table gives no information about any other part

Table B at the back of the book is a table of random digits

To use random digits, give each individual a numerical label, using as few digits as possible, but each having the same number of digits.

To select a sample of the 50 states, we must use 2 digit numbers 01–50.

Enter the table anywhere and read two digit groups...(no repeats, and skip any >50

Line 103

45467 71709 77558 00095 32863 29485 82226 90056

Sampling with Technology

TI84 Let the calculator pick a number between 1 and 5

Press MATH, PRB, 5.randInt (or 8.randIntNoRep)

Lower 1, Upper 5, n=1

How many 1's? 2's? 3's? 4's? 5's?

Now try to pick 6 out of 50 states to sample...

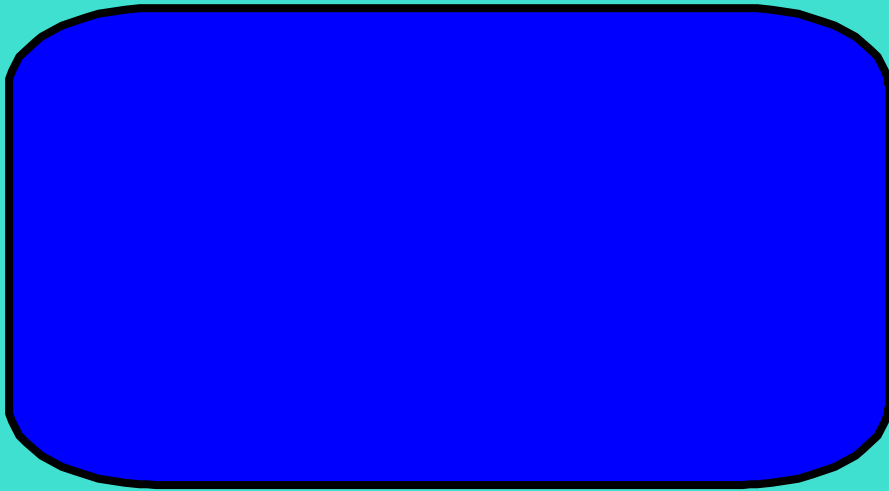
MATH, PRB, 5. randInt, Lower 1, Upper 50, n=6

Can you trust a sample?

- Voluntary Sample
- Convenience Sample
- Simple Random Sample

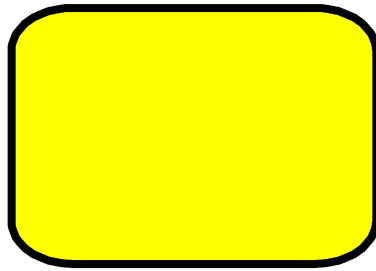
Knowing how a sample was chosen helps to gain our confidence

Where have you seen a SRS used?



Quiz 5.1 A & B.xps

How many fish were there?



Quiz 5.1 A and B Worksheets

Attachments

How many fish in the sea outline.xlsx

Quiz 5.1 A & B.xps